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THE PETROLEUM INDUSTRY IN CUBA

CIA/RR EP 62-5

February 1962

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CENTRAL INTELLIGENCE AGENCY

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FOREWORD

This publication presents a basic survey of the petroleum industry of Cuba. It is designed to update intelligence information published before the intervention of the Cuban government in the foreign-owned petroleum properties in mid-1960 and to consolidate intelligence collected since then. No attempt has been made to speculate on future economic activities in the petroleum industry.

Some difficulty was experienced in converting statistics to the standard unit of barrels (equivalent to 42 US gallons) in this publication. Published data for the years up to the middle of 1960 were reported in barrels and barrels per day. Data for the period since mid-1960 have been reported in metric tons. Volumetric data in this publication are expressed in barrels. Tonnages reported in source materials have been converted at the rate of 7.3 barrels per metric ton. Unless otherwise indicated, no attempt has been made to convert reported tonnages of individual petroleum products on the basis of specific weights. Tonnages per year may be converted to barrels per day by dividing by 50, and barrels per day may be converted to metric tons per year by multiplying by 50.

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THE PETROLEUM INDUSTRY IN CUBA*

Summary and Conclusions

Cuba has practically no domestic reserves of primary energy, but because of its favorable location in relation to the vast resources of petroleum in the Caribbean areas, particularly Venezuela, the economy of Cuba was developed with heavy dependence on petroleum as a source of energy.

In the period before the Castro revolution, petroleum provided about 50 percent of the total supply of energy. Most of the remainder was provided by bagasse, a waste product of the sugar industry. Cuba produces only nominal quantities of crude oil from domestic deposits and thus is dependent on imports for almost all of its supply of petroleum. The prospects for finding and producing crude oil from domestic deposits are unfavorable. The dependence on imports of petroleum, therefore, is expected to continue indefinitely.

Before mid-1960, about 95 percent of Cuba's imports of petroleum originated in the Caribbean area, principally Venezuela. Exports of oil to Cuba represented about 3 percent of Venezuela's total exports of oil. Since that time the countries of the Soviet Bloc, particularly the USSR and Rumania, have supplied oil to Cuba. This shift in supply to Bloc sources brought about the intervention by the Cuban government in the refineries of the foreign oil companies in June 1960 and their ultimate expropriation in October 1960.

The Soviet-Cuban Commercial Agreement of 13 February 1960 provided for the shipment of petroleum to Cuba. Following the refusal of the oil companies to accept Soviet crude oil in their refineries, the Cuban government took control of the refineries. Resistance against other government pressures by the oil companies culminated in confiscation of the US oil properties and other properties of 164 US concerns. The refinery of the Shell Oil Company, a non-US firm, was not confiscated but does continue under Cuban government control.

The demand for petroleum, crude oil and products, in Cuba in 1961 was about 77,000 barrels per day (bpd), a rate similar to that of Spain or Egypt and about one-half of that of Communist China. About one-half

* The estimates and conclusions in this publication represent the best judgment of this Office as of 15 January 1962.

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of the total demand in recent years has been for fuel oil, and almost one-half of the total supply was consumed by the transport sector.

Of the six refineries in Cuba, only the Esso, Shell, and Texaco plants are of commercial importance. The total capacity of these three plants was about 83,000 bpd, which was more than sufficient to satisfy Cuba's demand. Refined products had been exported to markets in the West Indies and Central America, but the supply of these markets was shifted from Cuba when the properties of the oil companies were expropriated. The use of Soviet crude instead of Venezuelan, for which the refineries were designed, together with a lack of proper replacement parts and materials, probably has had a damaging effect on the refineries. It will be some time before the cumulative damage can be measured, but the quantity of crude being delivered to Cuba suggests that the damage after 18 months has not been too severe. Future deliveries of oil to Cuba will give an indication of the performance of the refineries as well as a measure of the level of economic activity.

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I. Introduction

The domestic resources of primary energy in Cuba are negligible. There are no known deposits of coal, and the deposits of lignite and peat are small, occurring in scattered and inaccessible locations. The hydroelectric potential is insignificant, and the prospects for the discovery of crude oil in commercial quantities are unfavorable.

In the period immediately before the Castro revolution, imported petroleum provided Cuba with about one-half of the total supply of energy from primary sources, and bagasse* supplied practically all of the remainder. The output of bagasse, therefore, is dependent on the level of activity in the sugar industry. Coal makes a negligible contribution to the supply of energy in Cuba.

Three foreign oil companies, Esso, Shell, and Texaco, supplied most of the oil imported, refined, and marketed in Cuba at the time that Castro came to power in January 1959. Early in 1960 the regime made serious attempts to change the old order. The Soviet-Cuban Commercial Agreement signed on 13 February 1960 provided for the supply of crude oil by the USSR. In May 1960 the government of Cuba requested that Esso, Shell, and Texaco process Soviet crude oil in their refineries. The government exerted other pressures on the foreign oil companies -- for example, threats of expropriation if the companies failed to maintain the level of imports of oil in spite of the failure of the government to pay its debt to the companies, of price controls, and of refusals to permit exchange remittances to cover imports of oil and to permit foreigners to occupy certain key jobs in the industry.

Resisting these pressures, the oil companies refused to refine Soviet crude. Consequently, the government took control of the refineries by intervention on 30 June 1960. The properties of the US oil companies were confiscated on 25 October 1960 as part of Cuban Law Decree 85, which nationalized 164 US companies. The Shell refinery continues under intervention but has not been expropriated formally. Since mid-1960, countries of the Soviet Bloc, principally the USSR and Rumania, have been the sole source of oil for Cuba.

II. Administration

The petroleum industry in Cuba is administered by the Cuban Petroleum Institute (ICP), which was created in 1960 as an agency of the

* Bagasse is a fibrous, combustible waste product of the refining of sugar and is used exclusively by the sugar industry for boiler fuel.

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Industrial Department of the National Institute for Agrarian Reform (INRA) and subsequently transferred to the Ministry of Industries. The ICP has complete responsibility for all phases of the petroleum industry from exploration to marketing. All plans for the industry, however, are subject to the approval of the National Planning Board. There is evidence that Ernesto (Che) Guevara, as Minister of Industries, actually makes policy decisions for the ICP.

Alfonso Gutierrez had headed the ICP as Director General from its inception in 1960. Gutierrez, a Mexican freelance oil specialist, previously was affiliated with Petroleos Mexicanos (PEMEX), the state-owned oil monopoly in Mexico. Gutierrez resigned as head of ICP in September 1961 and reestablished himself in private business in Mexico City. His successor has not been identified.

The managerial structure of the ICP as of November 1961 consisted of the following:

1. Executive Board composed of
 - a. President, who also was the chief of the Industrialization Department of INRA
 - b. Director General
2. Board of Directors (Six)
3. Subdirectors for
 - a. Production: Alberto Bozzolo
 - b. Marketing : Onelio Pino
 - c. Refining : Salvador Salo
 - d. Accounting: Eugenio Latour Manzilla
 - e. Personnel : Melba Hernandez

III. Exploration and Production

The earliest recorded discovery of oil in Cuba was in Habana Province in 1864. From then until 1954, only three small fields -- Bacuranao in Habana Province and Motembo and Jarahueca in Las Villas Province -- had been discovered.*

The Jatibonico field in Camaguey Province was Cuba's most important discovery. Although small by normal commercial standards, this discovery in 1954 stimulated interest in Cuba's possible oil resources. At the end of 1956, about 36 companies, about one-third of them Cuban,

* For locations of oilfields and other petroleum facilities, see the map, inside back cover.

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were exploring for oil. Since 1952, however, only four small discoveries have been made, and all of these were in the area of the Bacuranao field near the city of Havana. Production of crude oil from the six producing fields in 1959 and 1960 is shown in Table 1.

Table 1

Cuba: Production of Crude Oil
1959-60

<u>Oilfield</u>	<u>Barrels per Day</u>	
	<u>1959</u>	<u>1960 a/</u>
Cruz Verde	60	30
Guanabo	41	18
Jarahueca	27	27
Jatibonico	373	293
Motembo	8	7
Santa Maria	25	15
Total	<u>534</u>	<u>390</u>

a. The rate of production for 1960 is estimated on the basis of data published for the first 6 months.

Production shown in the table represents less than 1 percent of the daily demand for oil in Cuba. Production in 1961 probably did not exceed that in 1960.

There are no realistic estimates of proved crude oil reserves in Cuba, but it is unlikely that reserves exceed 2 million barrels, which, in terms of world reserves or Cuba's needs, is negligible. The ratio of 1960 reserves to production is about 1⁴ to 1. A similar ratio exists in the US, but the absolute reserves in the US are about 32 billion barrels. A Cuban oil prospector who claims to have drilled more than 400 wells in Cuba since 1929 insists that Cuba never will become an oil-producing country. He indicated that seismic movements over the years have destroyed oil deposits. Deposits of natural gas of sufficient size to justify commercial exploitation have not been discovered.

By the end of 1959, all private exploratory work in Cuba had ceased, and 1 year later all private oil concessions had been canceled. At the time of the intervention the ICP had custody of a total of 12 drilling rigs, one-half of which were being cannibalized for parts to keep the

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other half operational. Although oil technicians from the Soviet Bloc have arrived in Cuba, there is no evidence that any Bloc drilling equipment has been delivered. The level of exploratory work now being done is not known, but it is unlikely that any discoveries of crude oil in commercial quantities will be made in the near future. A report that the Cubans will drill 36 wells for a total of 248,000 feet in 1962 is discounted as being inordinately ambitious.

IV. Refining

The refining capacity in Cuba on 1 January 1960 is shown in Table 2.* Only the three foreign-owned refineries -- Esso, Shell, and Texaco -- are of commercial importance and warrant discussion in detail. The small topping plants at Bacuranao and Cotorro in Habana Province serve the local oilfields. The other small plant at Cabaiguan in Las Villas Province was to be moved to Cienfuegos to form the basis for a new larger refinery, but work on this project had not been started as of early 1961.

Following the refusal of Esso, Shell, and Texaco to refine Soviet crude oil, the Cuban government took temporary control of the refineries by intervention in June 1960. This control was made permanent in October 1960, when the oil properties of Esso and Texaco were expropriated and nationalized. The Shell plant has not formally been expropriated, although it continues to be controlled under the original intervention. The Esso and Shell refineries in Havana subsequently were renamed the Nico Lopez Refinery and are operated as a single complex. The Texaco refinery at Santiago de Cuba was renamed the Hermanos Diaz Refinery.

The Cuban refineries were designed to operate on crude oil from the Caribbean area, principally from Venezuela. They were able to produce a full line of refined products, including aircraft fuels, but there were no facilities for the manufacture of lubricating oils. The particular Venezuelan crude usually supplied -- Oficina -- was low in salt, sulfur, and wax. Crude oil supplied by the USSR since mid-1960, although of generally acceptable quality, contained more salt and sulfur than would normally be introduced into the refinery. There were no desalters in the refineries, and the combination of salt and sulfur precipitated operational and maintenance problems.

There were continuing reports of the effects of corrosion attributable to the Soviet crudes. Moreover, there were reports of operating difficulties attributable to the loss of skilled personnel. These problems, although not completely disabling, appear to have resulted in a moderate reduction in crude oil throughput in the refinery. The quantity of crude oil supplied by the Soviet Bloc since mid-1960 was at the

* Table 2 follows on p. 7.

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Table 2

Cuba: Refining Capacity
1 January 1960

Thousand Barrels per Day					
Refinery	Crude Distillation	Cracking		Catalytic Reforming	Desulfurization
		Catalytic	Thermal		
Esso	36	13 <u>a/</u>		2.5 <u>b/</u>	4.7 <u>c/</u>
Shell	27			5.0 <u>d/</u>	
Texaco	20			3.3 <u>d/</u>	4.1 <u>e/</u>
Cabaiguan	2		0.6		
Bacuranao	Negl.				
Cotorro	Negl.				
Total	<u>85</u>	<u>13</u>	<u>0.6</u>	<u>10.8</u>	<u>8.8</u>

- a. Fluid catalytic cracking.
- b. Powerformer.
- c. Hydrofiner.
- d. Platformer.
- e. Hydrotreater.

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rate of about 60,000 bpd, whereas crude was imported at the rate of about 70,000 bpd in 1959. This reduction was offset by increased imports of products.

The difficulty in obtaining alumina/silica catalyst* for the cracking unit of the Esso refinery has resulted in a reduction in the amount of liquefied petroleum gas (LPG) available for curing tobacco during the harvest. LPG also is used widely as household fuel and to a limited extent in industry.

The difficulty in obtaining platinum catalyst for the catalytic reforming units in the Esso and Texaco plants has resulted in a deficiency in production of hydrogen, which is essential to the operation of the associated desulfurization units. When distillates from Soviet crudes are not desulfurized, the quality of gasolines and distillate fuels is impaired. Moreover, failure to reduce the sulfur content in gasoline to a minimum results in increased need for relatively costly tetraethyl lead (TEL) to improve the octane quality.

Some of the obstacles that hindered operation of the refineries in the period immediately after the expropriation have since been overcome. The deleterious effect of the prolonged use of Soviet crude oil coupled with the effects of poor maintenance resulting from the lack of replacement parts and equipment, however, probably will reduce further the capability of the refineries to produce products of suitable quality in adequate quantities. The level of the deliveries of crude oil to Cuba will serve as an indication of the level of operation of the Cuban refineries.

V. Demand

The total demand for petroleum in Cuba in 1961, based on observed imports of crude oil and products, was about 28 million barrels, equivalent to a rate of about 77,000 bpd. This rate represents an increase of about 5 percent in comparison with the estimated demand for 1960. The total civil and military demand for petroleum, by products, for the years 1958-60 is shown in Table 3.** The demand for oil in 1960 was estimated in mid-1960 by the oil companies at 73,000 bpd, and no subsequent reports on either civil or military demand are available. The total shipments of crude oil and products to Cuba from the Soviet Bloc in the last half of 1960 were at a higher rate, about 80,000 bpd, and may reflect (1) a more generous estimate of demand by the new regime or (2) an increased demand by the military.

* The details of Cuba's dependence on outside sources for the supply of essential equipment and materials for the refineries are discussed in Appendix B.

** Table 3 follows in Appendix A, p. 13, below.

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About one-half of the total demand for petroleum products in Cuba is for residual fuel oil, a demand that would be expected where there is a lack of coal or other solid fuels. Gasoline and diesel fuel, used extensively in trucks and buses, represent almost 40 percent of the total demand for petroleum products. Other countries, such as those in Western Europe where substitute fuels are available, can convert to the use of substitutes when supplies of petroleum are jeopardized, but it is unlikely that there will be much substitution of other fuels for petroleum in Cuba. The sources of coal, excluding the former suppliers in the US, are no closer than the suppliers of oil in the USSR or other countries of the Soviet Bloc. Considerable time and investment would be required to convert oil-burning equipment to the use of solid fuels or gas.

The relative demand for specific petroleum products by principal type of consumer and the share that each type represented of the total demand in 1958, the last year for which such detailed data are available, are shown in Table 4.* The transport sector, which consumed virtually all of the gasoline and jet fuel and more than 80 percent of the fuel oils (diesel and residual) also consumed more than 40 percent of all the petroleum products. Industry and electric power were the next largest consumers in the economy. In each of these two sectors, fuel oil was the principal product consumed.

The data for 1958 are considered to represent the demand for petroleum under "normal" circumstances. It is acknowledged that distortions in this pattern have occurred since mid-1960, with more products undoubtedly being diverted to support the military establishment in Cuba. This diversion may explain the apparent contradiction of increased supplies of petroleum in the face of reported internal economic decline. In any event the pattern of demand shown in Table 4 depicts the acute dependence of all elements of the economy on imported petroleum.

VI. Foreign Trade

The composition of imports of petroleum for the years 1958-61 is shown in Table 5.** Before the middle of 1960, all of Cuba's imports of petroleum were provided from sources in the Western Hemisphere. About 95 percent of the total imports came from suppliers in the Caribbean area, principally Venezuela, and the remainder came from the US. Exports to Cuba represented about 3 percent of Venezuela's total exports in both 1958 and 1959.

Under the terms of the Soviet-Cuban Commercial Agreement, the Cubans indicated a desire to import from the USSR in 1960 the equivalent of about

* Table 4 follows in Appendix A, p. 14, below.

** Table 5 follows in Appendix A, p. 15, below.

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30,000 bpd of crude oil, or about one-half of total Cuban imports. Subsequent to the Cuban intervention in the foreign refineries in June 1960, all imports of petroleum into Cuba have originated in the Soviet Bloc, principally the USSR. The composition of Cuban imports from the Bloc in 1960 and 1961 is shown in Table 6.* There have been reports that the USSR has approached representatives of Venezuela regarding resumption of exports of oil from Venezuela to Cuba. Available information suggests, however, that there will be no reduction in the amount of oil that the Bloc is prepared to ship to Cuba in 1962. Reduction of economic activity in Cuba, which would affect the internal demand for petroleum, probably would be reflected in the quantity of petroleum that the Bloc would provide.

Cuba has no oceangoing tankers and is dependent on outside sources for tankers. The following tabulation shows the percentage composition by flag of the tankers employed in the delivery of oil to Cuba since mid-1960:

<u>Flag</u>	<u>1960 (6 months)</u>	<u>1961 (12 months)</u>
Soviet	50	42
Satellite	4	1
Free World	46	57

Rather sizable quantities of products -- equivalent to about 20 percent of total Cuban imports both in 1958 and in 1959 -- were exported from Cuba to countries of the West Indies and Central America. These markets had been developed by the oil companies and were lost to Cuba when the Cuban government intervened in the foreign companies.

* Table 6 follows in Appendix A, p. 16, below.

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APPENDIX A

STATISTICAL TABLES

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Table 3

Cuba: Estimated Domestic Demand for Petroleum Products a/
1958-61

	<u>1958</u>		<u>1959</u>		<u>1960</u>		<u>Thousand Barrels</u> <u>1961</u>
	<u>Quantity</u>	<u>Percent</u>	<u>Quantity</u>	<u>Percent</u>	<u>Quantity</u>	<u>Percent</u>	<u>Quantity b/</u>
Gasoline	6,272	27.2	6,821	27.6	6,992	26.1	N.A.
Aviation	277	1.2	245	1.0	187	0.7	N.A.
Motor	5,995	26.0	6,576	26.6	6,805	25.4	N.A.
Jet fuel	55	0.2	98	0.4	186	0.7	N.A.
Kerosine	1,039	4.5	1,138	4.6	1,218	4.5	N.A.
Diesel fuel oil	3,026	13.2	3,210	13.0	3,371	12.6	N.A.
Residual fuel oil	11,683	50.7	12,368	50.0	13,846	51.6	N.A.
Lubricants	226	1.0	249	1.0	259	1.0	N.A.
Other	732	3.2	840	3.4	950	3.5	N.A.
Total	<u>23,033</u>	<u>100.0</u>	<u>24,724</u>	<u>100.0</u>	<u>26,822</u>	<u>100.0</u>	<u>28,127</u>
Barrels per day	63		68		73		77

a. Quantities have been rounded to the nearest thousand barrels.

b. The quantity shown for 1961 represents the total observed shipments of crude oil and products from the Soviet Bloc and excludes nominal quantities of crude oil from domestic sources.

Table 4

Cuba: Percentage Distribution of Domestic Demand for Petroleum Products
by Principal Consumer and Type of Product
1958

								Percent of Demand	
Consumer	Aviation Gasoline	Motor Gasoline	Jet Fuel	Kerosine	Diesel Fuel Oil	Residual Fuel Oil	Lubricants	Other	Total Products
Transport a/	100.0	99.0	100.0	0	70.0	11.3	39.9	0	42.5
Automotive					55.5	0			
Rail					13.8	10.0			
Bunker					0.7	1.3			
Agriculture	0	0	0	0	20.0	0	27.2	0	2.9
Electric power	0	0	0	0	6.5	36.0	1.8	0	19.1
Industry	0	1.0	0	0	3.5	52.7	31.1	12.8	28.2
Mining						17.3			
Other						35.4			
Household	0	0	0	100.0	0	0	0	35.9	5.7
Other	0	0	0	0	0	0	0	51.3	1.6
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

a. Including, in addition to those subcategories listed, other modes of transport.

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Table 5

Cuba: Foreign Trade in Crude Oil and Petroleum Products a/
1958-61

	<u>Thousand Barrels</u>		
	<u>Crude Oil</u>	<u>Petroleum Products</u>	<u>Total</u>
	<u>1958</u>		
Imports	25,755	4,392	30,147
Exports	0	6,437	6,437
Net imports	25,755	-2,045	23,710
	<u>1959 <u>b/</u></u>		
Imports	25,402	4,398	29,800
Exports	0	5,000	5,000
Net imports	25,402	-602	24,800
	<u>1960 <u>c/</u></u>		
Net imports	24,204	3,700	27,904
	<u>1961 <u>d/</u></u>		
Net imports	20,584	7,543	28,127

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Table 6

Cuba: Estimated Imports of Crude Oil and Petroleum Products from the Soviet Bloc ^{a/}
1960-61

Commodity	Thousand Barrels ^{b/}					
	1960 ^{c/}			1961		
	USSR	Rumania	Total Bloc	USSR	Rumania	Total Bloc
Gasoline	287	114	401	693	0	693
Kerosine	0	153	153	199	0	199
Diesel fuel oil	219	41	260	969	77	1,046
Residual fuel oil	2,412	71	2,483	5,566	0	5,566
Lubricants	83	0	83	39	0	39
Total products	<u>3,001</u>	<u>379</u>	<u>3,380</u>	<u>7,466</u>	<u>77</u>	<u>7,543</u>
Crude oil	11,003	0	11,003	20,584	0	20,584
Grand total	<u>14,004</u>	<u>379</u>	<u>14,383</u>	<u>28,050</u>	<u>77</u>	<u>28,127</u>

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APPENDIX B

DEMAND FOR PARTS AND RELATED MATERIALS FOR THE MAINTENANCE
AND THE OPERATION OF THE CUBAN PETROLEUM INDUSTRY

Cuba probably can maintain and operate its petroleum industry equipment by using domestic and Soviet Bloc sources of supply. The continued operation of the three important refineries in Cuba, however, will become increasingly difficult unless sources of supply from the Free World are available. Dependence on supplies from the Free World for essential materials and equipment for the refineries represents the most important single economic vulnerability of Cuba's petroleum industry.

Many of the difficulties in the refineries were reported immediately after the expropriation and may have been exaggerated. In spite of such exaggerations, the cumulative deleterious effect of running Soviet crude oil during the past 18 months in refineries designed to operate on significantly different crude oil would be severe. The absence of recent reports of serious difficulties and the high level of Soviet crude oil inputs, however, suggest that current problems are not disabling. Although the refineries might be disabled for lack of replacement parts and materials, the economy could shift to the imports of petroleum products rather than that of crude oil and thus continue to function.

There is a continuing need in the Cuban refineries for the following items that are not available from domestic sources.

1. Parts and Equipment

a. Cuba has an acute need for spare parts for refinery instruments, most of which are of US manufacture or design. The USSR has indicated that it could not provide parts for these instruments but could replace a complete instrument with one of Soviet manufacture. Cuba has made attempts to procure spare parts from Canada and the US.

b. The Soviet Bloc manufactures valves that are similar to, but do not conform to, standards of the American Petroleum Institute (API) or the American Standards Association (ASA). Although the Bloc cannot provide replacement parts for the valves in the Cuban refineries, it can provide complete valve assemblies.

c. Cuba is reported to have approached suppliers from the Free World for parts for gas turbines and pumps.

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d. Efforts have been made to procure carbon steel tubes of small diameter for heat exchangers and condensers from suppliers in Western Europe.

e. Ball bearings for a pump were received from Canada because the Bloc could not supply them.

2. Materials

a. Cuba depends on imports of tetraethyl lead (TEL) for use in improving the quality of gasoline. Although the USSR, which has been deficient in the supply of TEL, provided some to Cuba in 1960, it was reported that no further shipments would be made until 1962. The manufacture of TEL in the Free World is limited to only a few countries outside the US. In the Bloc, both the USSR and East Germany manufacture TEL. TEL is important to the manufacture of gasoline, and there are no known suitable substitutes, although the Cubans have resorted to the use of alcohol as an expedient.

b. The high salt content of Soviet crude oil causes operating difficulties in the refineries, some of which can be reduced by the injection of ammonia into the system. Cuba has been reported to be seeking supplies of ammonia in countries of the Free World.

c. Although Cuba does not manufacture lubricating oils, it does obtain and blend raw materials to obtain finished lube oils. In the course of the blending, proprietary chemicals are added to obtain certain quality features in the finished products. Cuba has been having difficulty in obtaining such chemical additives, most of which are manufactured in the US or under US license elsewhere in the Free World.

d. The refineries use alumina/silica and platinum catalysts. It was reported that the alumina catalyst imported from the USSR was unacceptable and that the catalyst imported from the Netherlands was also substandard. Platinum catalyst is manufactured only in the US. Attempts also have been made to procure catalysts from or through the US, West Germany, the UK, and Canada.

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APPENDIX C

STORAGE AND DISTRIBUTION FACILITIES OF THE CUBAN PETROLEUM INDUSTRY

The location, the capacity, and the services of the principal bulk oil storage facilities in Cuba are shown in Table 7.* The bulk oil storage facilities by principal user -- that is, refineries, nonrefinery oil company, and nonoil company -- are summarized in Table 8.** It is noteworthy that about 25 percent of the total storage in service for products is located in sugar mills, powerplants, and other industries and thus is considered as nonoil company storage. Moreover, about 40 percent of the total is located in refineries or is used for refinery operations and therefore is not normally available for storage purposes. Thus the figure for total storage overstates the quantities available for distribution or military allocation of the oil.

The crude oil storage when completely full would represent about 20 days of supply based on the rate of consumption in 1961. This level of supply, 20 days, was not such a critical consideration when the sailing time from the source of crude oil supply in Venezuela was only about 5 days. The sailing time from the Black Sea, however, represents about 20 days. The Cubans apparently recognize the danger inherent in long supply lines and obligated about \$1.5 million in Cuba's budget for 1962 for construction of additional crude oil storage. The nonrefinery storage in Cuba represents about 60 days of supply at the rate of consumption in 1961. There are no pipelines in Cuba, and all internal land transport is effected by rail and truck. The rail tank car park as of 30 June 1959 consisted of 80 cars for oil service, 60 for molasses, and 34 for water. Cuba has a few small non-self-propelled barges for the coastal movement of oil but has only one tanker for coastal shipping -- the Playa Giron (formerly the Soviet vessel Syurkum) -- of 750 deadweight tons.

* Table 7 follows on p. 21, below.

** Table 8 follows on p. 31, below.

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Table 7

Cuba: Principal Bulk Oil Storage Facilities
1 January 1960

Location: terminal or site	Coordinates		Capacity (Thousand Barrels)			
			Products			Total
	North	West	Crude Oil	Clean	Dirty	
Habana	23°08'	82°21'				
Ensenada de Guasabacoa						
Compania Cubana de Petroleo				10.6	158.9	169.5
Compania Petrolera Shell-Mex de Cuba, S.A.				172.5		172.5
Sinclair Cuba Oil Co., S.A.				140.6	165.0	305.6
Esso (Belot)						
Esso Standard Oil Co., S.A. (Belot) (Nico Lopez Refinery)			680	1,271.64	281.2	1,552.84
Texaco						
Texas Co. (West Indies), Ltd.				94.9		94.9
Shell Belot Refinery (Nico Lopez Refinery)			600	675.99	427.5	1,103.49

Table 7

Cuba: Principal Bulk Oil Storage Facilities
1 January 1960
(Continued)

Location: terminal or site	Coordinates		Capacity (Thousand Barrels)			
			Products			Total
	North	West	Crude Oil	Clean	Dirty	
Habana (Continued)						
Tallapiedra Consolidados					67.45	67.45
Ebasco						
Melones					82.87	82.87
Ebasco						
Regla Plant					30.00	30.00
Ebasco						
Santiago de Cuba	20°01'	75°50'			56.20	56.20
Compania Cubana de Electricidad						

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Table 7
(Continued)

Location: terminal or site	Coordinates		Capacity (Thousand Barrels)			
			Products			
	North	West	Crude Oil	Clean	Dirty	Total
Santiago de Cuba (Continued)						
Malecon Terminal						
Esso Standard Oil Co., S.A. (Esso S.A.)				165.04	43.19	208.23
Ferrocarriles Consolidados de Cuba					9.6	9.6
Shell-Mex Co. of Cuba				103.74		103.74
Texas Co. (West Indies), Ltd.				52.2	59	111.2
Punta Chivos						
Texas Co. (West Indies), Ltd. (Hermanos Diaz Refinery)			342.9	340.2	186.8	527.0
Punta Jutias						
Cementos Nacionales S.A.					90	90
Matanzas	23°03'	81°34'				
Sinclair						
Sinclair Cuba Oil Co., S.A.					165	165

Table 7
Cuba: Principal Bulk Oil Storage Facilities
1 January 1960
(Continued)

Location: terminal or site	Coordinates		Capacity (Thousand Barrels)			
			Products			
	North	West	Crude Oil	Clean	Dirty	Total
Matanzas (Continued)						
Texaco						
Texas Co. (West Indies), Ltd.				68.5	192	260.5
West India						
West India Oil Distributing Co., Ltd.					110	110
Cienfuegos	22°09'	80°27'				
Punta Arenas						
Texas Co. (West Indies), Ltd.					64	64
Punta Majagua						
Esso Standard Oil Co. (Cuba Division)					106.8	106.8
Punta Verde						
Sinclair Cuba Oil Co., S.A.				74.9	110	184.9

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Table 7
(Continued)

Location: terminal or site	Coordinates		Capacity (Thousand Barrels)			
			Products			
	North	West	Crude Oil	Clean	Dirty	Total
Antilla	20 48'	75 42'				
Antilla Terminal						
Ferrocarriles Consolidados de Cuba					55	55
Preston Terminal						
United Fruit Sugar Company					47.8	47.8
Nuevitas	21 33'	77 15'				
Pastelillo						
Esso Standard Oil Co., S.A. (Esso S.A.)					130	130
Sinclair Cuba Oil Co., S.A.				111.3	110	221.3
Tarafa						
Compania de Ferrocarriles de Cuba					165.3	165.3

Table 7
Cuba: Principal Bulk Oil Storage Facilities
1 January 1960
(Continued)

Location: terminal or site	Coordinates		Capacity (Thousand Barrels)			
			Production			Total
	North	West	Crude Oil	Clean	Dirty	
Guantanamo	19°55'	75°09'				
Boqueron						
Esso Standard Oil Co.				49.5	55	104.5
Desco						
Guantanamo Sugar Company					55	55
Banes	20°55'	75°42'				
United Fruit						
United Fruit Sugar Company					47	47
Cardenas	23°03'	81°12'				
Arechabala						
Jose Arechabala, S.A.					28.6	28.6

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Table 7
(Continued)

Location: terminal or site	Coordinates		Capacity (Thousand Barrels)			
			Products			
	North	West	Crude Oil	Clean	Dirty	Total
Casilda	21°45'	79°59'				
Adjacent to wharfs						
Central Oil Co.			90	32.8	45	77.8
Ceiba Hueca	20°14'	77°19'				
Santa Regina						
Compania Azucarera Santa Regina					31.3	31.3
Ensenada Boca Grande	21°33'	78°40'				
Unknown						
Baragua Sugar Mill					23.8	23.8
Jucaro	21°37'	78°51'				
1/2 mile west of town						
Compania Azucarera Atlantica del Golfo					23.8	23.8

Table 7

Cuba: Principal Bulk Oil Storage Facilities
1 January 1960
(Continued)

Location: terminal or site	Coordinates		Capacity (Thousand Barrels)			
			Crude Oil	Products		
	North	West		Clean	Dirty	Total
La Isabela	22°57'	80°01'				
Isabela de Sagua						
Compania Distribuidora Villaclara				11.4		11.4
Lengua de Pajaros	20°43'	75°33'				
Adjacent to nickel company						
Nicaró Nickel Co.				10	385	395
Manati	21°24'	76°49'				
Manati						
Manati Sugar Co.					55	55

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Table 7
(Continued)

Location: terminal or site	Coordinates		Capacity (Thousand Barrels)			
			Products			Total
	North	West	Crude Oil	Clean	Dirty	
Manzanillo	20°21'	77°07'				
South of piers						
Unknown					6.45	6.45
Maríel	23°01'	82°45'				
Unknown						
Cuban Portland Cement					160	160
Palo Alto	21°36'	78°59'				
1/4 mile west of main pier						
Stenard Sugar Company					23.8	23.8
Puerto Cayo Moa	20°40'	74°56'				
Moa Bay						
Moa Bay Mining Co.				33.5	188	221.5

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Table 7

Cuba: Principal Bulk Oil Storage Facilities
1 January 1960

Location: terminal or site	Coordinates		Capacity (Thousand Barrels)			
			Products			Total
	North	West	Crude Oil	Clean	Dirty	
Puerto Padre	21°14'	76°33'				
Cayo Juan Ciaro						
Cuban American Sugar Co.				19.9	156	175.9
Santa Lucia	22°41'	83°58'				
Next to copper company						
Copper company (name unknown)					50	50
Tanamo	20°42'	75°20'				
Punta Gorda						
Compania Azucarera Tanamo de Cuba				14.85	47.7	62.55
Puerto Vita	21°05'	75°57'				
Unknown						
Compania Santa Lucia					12.2	12.2
Total			<u>1,712.9</u>	<u>3,454.06</u>	<u>4,307.26</u>	<u>7,761.32</u>

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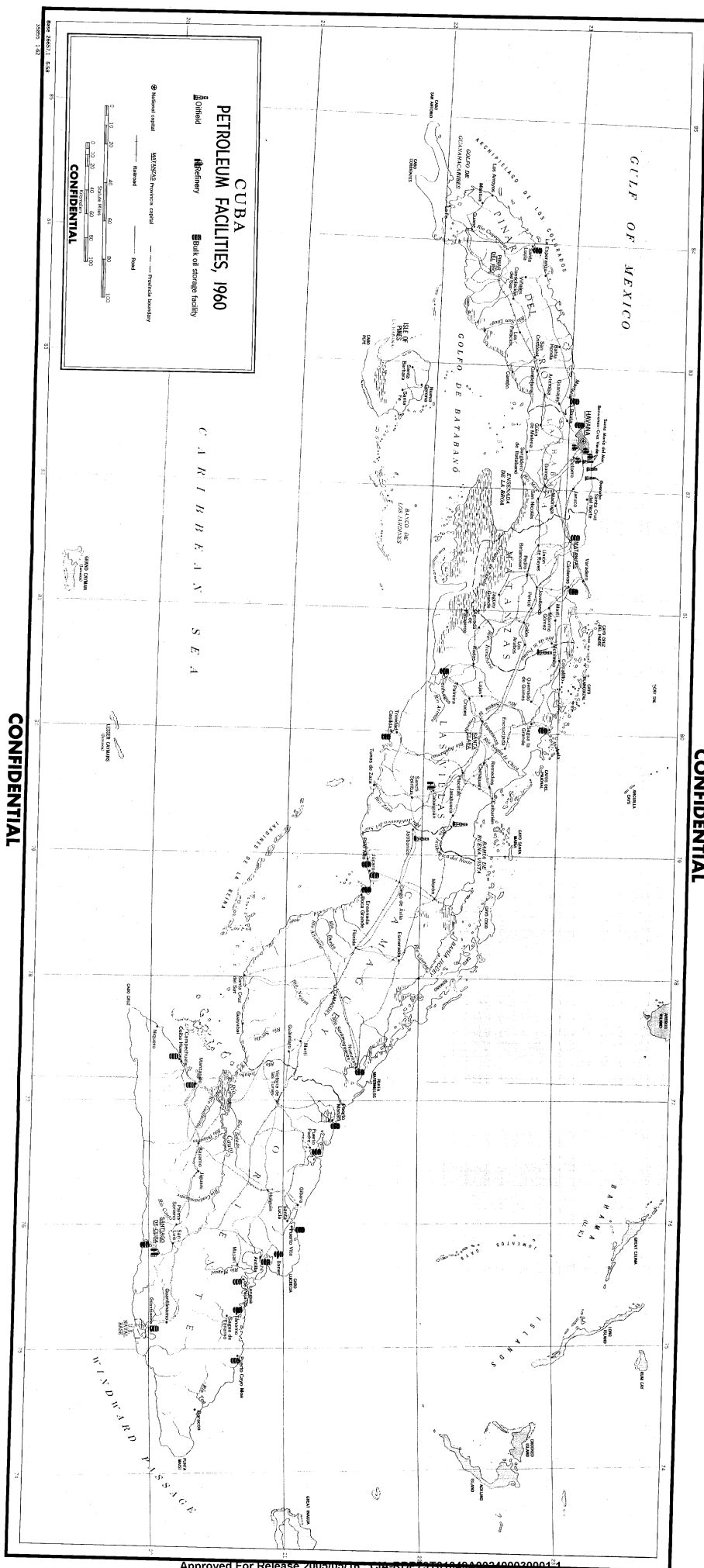
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Table 8

Cuba: Bulk Oil Storage by User Service
1 January 1960

<u>Thousand Barrels</u>		
<u>Category of User</u>	<u>Crude Oil</u>	<u>Products</u>
Refineries	1,712.9	3,183.33
Oil companies less refineries	0	2,620.52
Nonoil companies	0	1,957.47
Total	<u>1,712.9</u>	<u>7,761.32</u>

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